Shropshire Entomology

A bi-annual newsletter focusing on the study of insects and other invertebrates in Shropshire (Vice County 40)

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Welcome

Welcome to the 14th edition of *Shropshire Entomology*.

This edition includes some County Recorder reports for 2017 and the usual mix of other articles. Please do continue to submit your notes and articles. We are particularly keen to receive notes of new species for Shropshire. The deadline for the next edition, to be published April/May is 31 March 2018. Please send contributions to vc40insects@talktalk.net

Nigel Jones and Gordon Leel

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Past newsletters are still available for download as PDFs from www.invertebrate-challenge.org.uk/newsletters-and-resources.aspx

Submission guidelines for articles

Please wherever possible state authors for key species mentioned in the article eg. *Phaeostigma notata* (Fabricius, 1781)

Photographs should ideally be above 200kb in size. We may crop photos to fit. Please provide the photographer's name or the source of the photograph.

Please send text in a word file. Only use capital letters for site or people's names. Lower case letters should be used for vernacular or common species names except for those named after someone e.g.; Fallen's leatherbug.

Many thanks, the Editors

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Shropshire Entomology Day – Sunday 10 December 2017 at Preston Montford Field Centre.

Earwigs in Shropshire (VC40) in 2017

David Williams

Common Earwig

Ahead of the deadline for the forthcoming new National Orthoptera & Allies Atlas, I had set myself the target of recording common earwig, *Forficula auricularia,* (Linnaeus, 1758) in every hectad either wholly or partly within VC40. This is a not inconsiderable task, as Shropshire is a large county – there are 54 hectads to cover, the most distant of which are well over an hour away from my home. Fortunately there is a keen band of amateur entomologists active within Shropshire, and by the end of 2016 only four hectads remained. Three of these (SO88, SJ72 & SJ73) are on the Staffordshire border, whilst the other (SO17) is almost entirely in Wales. My plan was to attempt to record within Shropshire wherever possible, but failing that, a record anywhere within a hectad would 'knock it off'. In fact some of the records I am relying on elsewhere are from adjacent vice-counties.

The Staffs hectads were all recorded by July 14th (all within their Shropshire parts). SO17 was going to be more difficult. The only part of VC40 within the hectad is an inaccessible field in the north-east corner, so we had to settle for an hour & a quarter long journey to Beguildy in Wales, where on July 31st we duly beat an adult male within two minutes of arriving. We were 273 metres from Shropshire - about as near as we could get!

So that was that. Except that it wasn't. On re-checking my data, I realised that the record for SO27 (made by John Widgery), dated from 1996. Disaster – I want all records to be for the current Atlas period ie 1998 onwards. So off we went again, and on September 4th I evicted an adult female from a dead hogweed stem in Kinsley Wood, Knighton, to complete the task. I hope… if any of the NBN records from without VC40 on which I am relying somehow disappear, I will not be happy!

Common earwig, Beguildy, 31st July

Lesne's Earwig

The big news for Lesne's earwig, *Forficula lesnei* (Finot, 1887) this year is that I discovered it at a third site within the county – Coalmoor, in Telford. This site is much farther north than the previously-known locations, in a colder & more exposed part of the county. In fact a most unlikely site for this warmth-loving species.

I wrote in last year's newsletter "I believe that within VC40, the species is genuinely restricted to the relatively warm Severn corridor in the south-east corner of the county". Looking at the three known VC40 sites for Lesne's earwig, I now see a rather different link between them. All three are brownfield sites, having been mined or quarried in some way. They have then been restored, including areas of tree planting. It is near or within these plantations that the earwig is found on all three sites. At Coalmoor, Lesne's earwig appears to be restricted to a very small area of the site, where it is vastly outnumbered by *F. auricularia*. I live about 1km from this site and have never found *F. lesnei* anywhere else in the area. Coalmoor is exposed, windy and cold. I believe that Lesne's earwig must have been introduced here and therefore likely at the other sites also. Exactly what the mechanism of introduction could be I am unsure, but perhaps earwigs may hide inside the plastic wrapping around the base of saplings in tree nurseries?

Lesne's earwig, Coalmoor, 19th May

Lesser Earwig

Shropshire records for lesser earwig, *Labia minor* (Linnaeus, 1758) are few and far between, a poor reflection on my recording efforts for this species. In Spring 2017 I started constructing a compost heap in my garden, as much in the hope of attracting the species as actually producing useable compost! On September 16th I was therefore delighted to discover both adults and nymphs within the heap. They appear to be irresistibly attracted to the windfall apples I have thrown in, scuttling in all directions when I remove the black plastic sheet which partially covers the heap. The earwigs must have moved in some time ago as they have evidently bred. At least one species of compost-heap-inhabiting pseudoscorpion is also present. How did they all find it so quickly? Isn't Nature wonderful?

Lesser earwig, my garden, 17th September

Rhyzobius lophanthae (Blaisdell, 1892) (Coleoptera: Coccinellidae) new to Shropshire (Photo: David Williams)

Rhyzobius lophanthae (Blaisdell, 1892) (Coleoptera: Coccinellidae) new to Shropshire

Keith Fowler

This small "inconspicuous" ladybird was found in Shrewsbury on 1st November 2017 when it was beaten from a redwood (so I was informed) at the side of the path connecting the footbridge over the River Severn, close to the weir, to Cherry Orchards (GR SJ499129).

The beetle is oval about 2.5mm long, domed, very hairy with some longer erect hairs; the elytra are black and the head and pronotum rusty red. There are similar inconspicuous ladybirds but this is the only one where the pronotum is completely red.

The species is a native of Australia and was brought to Europe as a control agent for armoured scale insects early in the 20th century (Roy et al 2011). It was first found in Britain in 1999 and has been found periodically, mainly in the South East, since then. There are currently 34 records of the insect and its distribution is roughly south of the line from the Severn Estuary to the Wash (Roy 2017).

The ladybird was found during an outing to the weir to watch salmon leaping. Unfortunately the salmon did not oblige so the land on the other side of the river was scoured for things of interest. The find was the result of a casual beat of a tree that I passed in search of a suitable spot to have lunch.

The two beetles that were taken will be placed in the collection at Preston Montford.

Acknowledgement

My thanks to David Williams for photographing the specimens.

References

Roy, H., Brown, P., Frost, R. and Poland, R., 2011. *Ladybirds (Coccinellidae) of Britain and Ireland.* FSC Publications, Shrewsbury.

Roy, H., 2017, *Brilliant Beetles: a Focus on Ladybirds.* Worcestershire Entomology Day.

Dung beetles from the subfamily Sphaeridiinae, Latreille

Frances Riding

To most people the idea of a dung beetle is one from the family Scarabaeoidea, the scarab beetles. Most of the dung beetles within this family are from the genus *Aphodius* with fifty-five species which are found in all forms of dung and some found over winter. The larger dung beetles are in the genus *Onthophagus* but are principally of a southern distribution and dig burrows. Other large dung beetles which create burrows below the dung are in the family Geotrupidae.

Within the predominately aquatic family Hydrophilinae is the subfamily Sphaeridiinae which contains small to medium size beetles which live primarily within moist dung, including that of birds. The most numerous genus is *Cercyon*, these are small strongly rounded beetles with the meso and meta sternum being diagnostic in shape. Only a few *Cercyon* are truly aquatic.

Apart from the Cercyon there are several smaller genera within the Sphaeridiinae, the majority of which are associated with dung to a greater or lesser extent. The largest of these are the *Sphaeridium*, a group of four beetles with a liking for liquid dung. The two most common are *Sphaeridium scaraboides* (Linnaeus, 1758) and *S. lunatum* (Fabricius 1787) (Photos 1 and 2).

These beetles are common, occurring in cattle and horse dung. As with many specialist areas of entomology in Shropshire these beetles have few records, *S. lunatum* with two and *S. scaraboides* with eight. The larvae of these beetles eat the larvae of the yellow dung fly *Scathophaga stercoraria* (Linnaeus, 1758) (Diptera, Scathophagidae).

The genus *Megasternum* has only one species, *Megasternum concinnum* (Marsham 1802), (Photo 3) which is recognised by the NBN, though G. Foster (2014) recognises two species. Historically this species has two records from Shropshire. I have found it this year in the north of the county.

The largest group by far of the subfamily Sphaeridiinae is the genus *Cercyon*. Once again due to the specialist nature of collecting dung beetles and probably peoples distaste (it's only waste grass...) many of these species have few records within the county and in some cases outside the county. Some of the commoner species such as *Cercyon melanocephalus* (Linnaeus, 1758 and *C. haemorrhoidalis* (Fabricius, 1775) are simple to identify by the elytra pattern and colour (Photos 4 and 5). Though common they have few records.

Cercyon impressus (Sturm, 1807) (Photo 6) has four records and is found in cattle or sheep dung. The small impression at the rear of the pronotum is diagnostic. It is regarded as common. *Cercyon pygmaeus* (Illiger, 1801) (Photo 7) is a very small species, less than 2mm, and, until I found several of them in horse dung this October near Dudleston Heath, had only one record from 1925 which may have been doubtful. The shape of the lateral edge of the pronotum is diagnostic.

Lastly, though there are many more, *Cercyon ustulatus* (Preyssler,1790) (Photo 8), found near water edges in dung and rotting vegetation did have only three records but Dan Knight has lately added several records for this beetle around the general Oswestry area.

The final genus of three species that can be found in dung though only infrequently is *Crytopleurum*. The only species to be found in Shropshire is *Crytopleurum minutum* (Fabricius, 1775) (Photo 9). It has two records, both for Preston Montford. I have not found it yet.

Dung beetles are fascinating insects and they have an important function in farmland ecosystems. Their role in dung breakdown and as valuable prey for vertebrate predators has created a certain amount of interest in the last few years. Potential threats to dung beetle fauna include the use of avermectin based anthelmintics in livestock. Avermectin residues remain active once passed into the faeces of the treated livestock, therefore there is concern that exposure to residues adversely affect dung beetle populations (Webb, 2004).

References

Foster, G.N., Bilton, D.T. and Friday, L.E. 2014. Handbooks for the Identification of British Insects. Vol. 4. Part 5b. *Keys to adults of the water beetles of Britain and Ireland (Part 2)*. RES.

Webb, L. 2004. The Dung Beetles (Coleoptera: Scarabaeidae and Hydrophilidae) of Ayrshire, Scotland. Vol. 63. *Bulletin of the Amateur Entomologists' Society.*

Photo 1. *Sphaeridium scaraboides* 6.5mm

Photo 2. *Sphaeridium lunatum* 6.8mm

Photo 3. *Megasternum concinnum* 2mm

Photo 4. *Cercyon melanocephalus* 2.7mm

Photo 5. *Cercyon haemorrhoidalis* 2.9mm

Photo 6. *Cercyon impressus* 3.5mm

Photo 7. *Cercyon pygmaeus* 1.8mm

Photo 8. *Cercyon ustulatus* 3.1mm

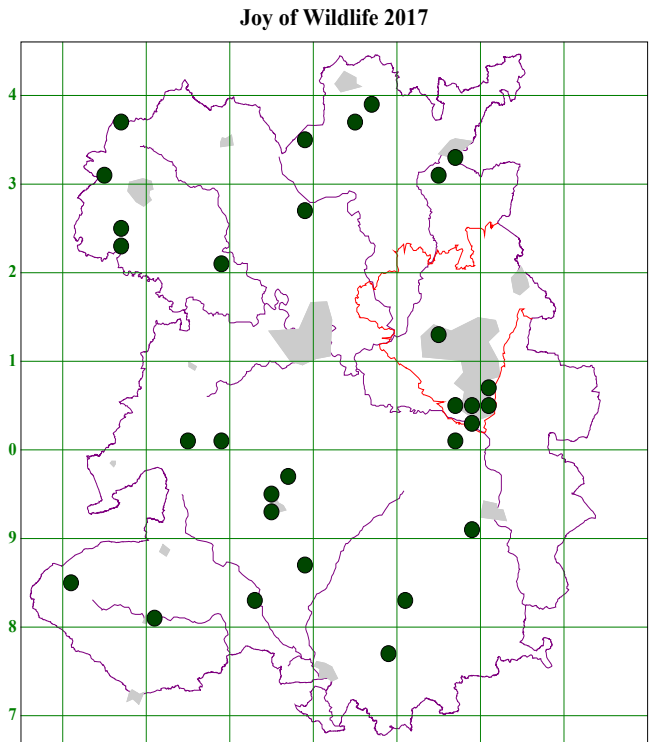
Photo 9. *Crytopleurum minutum* 2.0mm

Joy of Wildlife 2017

Keith Fowler

The start of October signalled the end of another hugely enjoyable series of visits to places scattered far and wide throughout Shropshire. In all we made 26 visits on each Wednesday throughout the period April to September plus four additional outings on a Sunday. We even managed four in the depths of winter.

The following map shows the distribution of the sites visited:



Somehow the environs of Shrewsbury missed out - must try harder next year!

Our first visit of the year was in January when we ventured onto the Stiperstones and visited Brook Vessons. We were rewarded with a very pleasant day for our audacity. Highlight of the day was finding the parasitic fungus *Cordyceps militaris*.

This was followed by another outing that could have gone horribly wrong if the weather had not been kind. Whixall Moss in February! For this trip we had a target species – the UKBAP and Nationally Scarce spider *Glyphesis cottonae*.

Parasitic fungus *Cordyceps militaris*. (Photo: Bob Kemp)

We found it, thanks to some judicious vacuum sampling of wet Spagnum moss.

The third visit ..... no, do not worry, I am not going to detail every outing but thought it worthwhile pointing out that there is plenty to keep us interested even in winter.

Throughout the year the weather was generally kind to us. We only had one trip that had to be abandoned due to rain but we still managed half

Vacuum sampling of wet *Spagnum* moss. (Photo: Keith Fowler)

Silver-washed fritillary *Argynnis paphia*. (Photo: Keith Fowler)

a day on the site before giving up and switching our attention to sampling the local brew. All other trips were completed albeit with the occasional sprinkling of rain. On the other hand we had few days when it was so hot that it was uncomfortable to be out in the open.

Once again the trips were supported by a core of half a dozen or so who came to most outings with many others coming occasionally or even just the once. I thank all the attendees for making the effort to join me. This makes the task of arranging and reporting on the programme seem insignificant. One bonus this year has been the willingness of our many photographers to share their pictures which has allowed me to include many high quality images in the reports. (In case you are not aware all the reports can be found at http://wrekinforestvolunteers.blogspot.co.uk/.)

There were many highlights. We had a smattering

Scarlet tiger *Callimorpha dominula*. (Photo: David Williams)

Six-belted clearwing *Bembecia ichneumoniformis*. (Photo: David Williams)

of county first records but Dolgoch Quarry provided me with three top "experiences" in one day, all of a lepidopteran kind.

First a Silver-washed fritillary *Argynnis paphia* that settled in front of us and posed for photographs but then decided to investigate the observers, settling on one of the group's face and then my hat.

Then a Scarlet tiger *Callimorpha dominula*.

And finally a Six-belted clearwing *Bembecia ichneumoniformis*.

We have three more outings before the end of the year but my thoughts are already turning to next year – where shall we go?

If you are interested in coming along to any of the trips please let me know (email: keith.c.fowler@blueyonder.co.uk). No commitment is necessary; you will be welcome whether you come once or many times.

My thanks to the Field Studies Council for their continued support of the Joy of Wildlife programme and to David Williams and Bob Kemp for allowing me to use their photographs. The distribution map was produced using DMap © Alan Morton.

Tortoise shieldbug range expanding?

Keith Fowler

In "*A provisional atlas of the shieldbugs and allies of Shropshire*" edited by Pete Boardman and published by the Fields Studies Council in 2014 the Shropshire distribution of Tortoise shieldbug *Eurygaster testudinaria* (Geoffroy, 1785) is limited to the Wyre Forest in SO77 having been recorded there for the first time in 2011. (There is also a specimen in the Frances Pitt collection housed in Ludlow Museum which may or may not be from Shropshire.)

In 2014 one was recorded in the opposite corner of the county in Dolgoch Quarry by J. Fairclough. This seemed a bit of an oddity but a check of the NBN when the record was received revealed that the bug had been recorded in North West Wales (although some distance away in hectad SH64). So, do we have two populations - one spreading from the south east and one arriving in the opposite direction, or have we just been overlooking a more widespread population?

During a visit to Dale Coppice and Rough Park in Telford last July, Jim Cresswell swept some grassland to try locating a Roesel's Bush-cricket which was singing in the vicinity. When David Williams checked the contents of the net he found that the bush-cricket had been missed but the net had chanced upon a nymph of the tortoise shieldbug.

Tortoise shieldbug nymph. (Photo: David Williams)

Subsequently I learned that the bug had turned up at a further site. Maria Justamond had discovered twenty or so individuals at Cramer Gutter.

A check of the NBN now reveals an earlier record than the "first" record noted in the atlas. In 2009 one was recorded by The National Trust. The details provided by this record are sketchy but the grid reference is provided, SO750911, which is close to Dudmaston.

These finds do not answer the question posed above but do indicate that its known range is expanding. Long may it continue! Please keep an eye out for this shieldbug and let me know of any that you find.

An underwater wasp

Nigel Jones

Brett Westwood informed me that the remarkable ichneumon wasp *Agriotypus armatus* Curtis, 1832 had been recorded by Ian Wallace in the Worcestershire part of the Wyre Forest in 2016. On 22 April 2017 Brett visited the Dowles Brook in the Shropshire part of the forest, where he noticed five or six dark ichneumons, with dark shaded wings, flying and running around on stones close to the stream. Brett immediately suspected *A. armatus* which amazingly, enters water to search for its host, the caddis *Silo pallipes* (Fabricius, 1781). Brett found the host under stones. Returning to the same spot an hour later, Brett was lucky enough to actually see one of the wasps walk off a stone to go beneath the water to search for a host larva (Figs. 1 and 2). It stayed beneath the surface for at least five minutes! Later, on 9 May Brett and Rosemary Winnall saw a single specimen several hundred metres east of the 22 April location.

Many of the valley woodlands that run into the River Severn in Shropshire, must surely be candidate sites for this extraordinary ichneumon. A 2018 early season field trip to the Borle Brook, near Highley may be called for?

Fig. 1 *Agriotypus armatus* walking over a stone (Photo: Brett Westwood)

Fig.2 *Agriotypus armatus* under water, walking over a mayfly larva (Photo: Brett Westwood)

Scarlet tigers in All Stretton

Mike Shurmer

Scarlet tiger *Callimorpha dominula* (Linnaeus, 1758) was first recorded in my All Stretton garden on 13 May 2015, when I found a larva on oxeye daisy *Leucanthemum vulgare*. Since that time, the species has quickly established a significant population in my garden. On 8 April 2016, I found 8 larvae feeding on green alkanet *Pentaglottis semperverins*, this being followed by several records of adults during the summer months. I felt that it was likely that a colony was being established.

This was confirmed this spring. I was delighted to find at least 36 larvae feeding on green alkanet on 17 April 2017, with there likely to be many more on plants inaccessible to view. I first noticed adults on 18 June, when three pairs were located in copulation, with several other adults seen over the following weeks. I thought that this was it for the year, until I investigated feeding damage on hazel *Corylus avellana* on 28 September. I found large numbers of feeding early instar scarlet tiger larvae. Whilst it was difficult to count the number present, I estimated at least 30 larvae were present.

Scarlet tiger habitat. (Photo: Mike Shurmer)

Scarlet tiger in copulation. (Photo: Mike Shurmer)

What I found most interesting about these observations is that the larvae were found in the spring feeding on green alkanet on a shallow bank at the edge of my garden, which makes up the road verge. Those found in the autumn were all on hazel immediately above the green alkanet plants, and were feeding on hazel despite there being green alkanet available to them. This suggests that the species is utilising two foodplants during its larval stage, a woody plant in the autumn and, following overwintering, a herbaceous plant in the spring. This may be due to the variation in the palatability and chemical composition of foodplants through the year, but needs further investigation to bear out what is happening.

Scarlet tiger larva on green alkanet. (Photo: Mike Shurmer)

Green alkanet and hazel are found along Batch Valley, where I live, and since first recording scarlet tiger I have regular searched these plants for larvae elsewhere on the road verges, without success.

The obvious difference between my section of road verge and the other sections is management. Shropshire Council enthusiastically strim the road verges several times from the early spring, destroying the green alkanet along with many other valuable plant resources. This does not happen on my verge, which I have persuaded them to leave untouched (threatening to lie down in front of their strimmers). Additionally, the hedgerows along the whole road are cut by the local farmer and gardeners in the late summer, apart from my section which I leave until the late winter. It is tempting to suggests that this management is what is causing the species to be confined to my section of road verge and that it would establish more widely if different management was observed. I hope to investigate this further to see if future patterns can be established.

New ladybird recorder

Gerry Thomas

Earlier in the year Ian advised he would hand over Ladybird Recording for the county, and following some communications between us and with Caroline over the last month or so, he has kindly handed over and entrusted the County Ladybird Recording to me from this year. It would of course, be an excellent group for any young entomologist to get to grips with but a youngster of 64 going on 65 is the best we could come up with!

So please forward your ladybird records from 2017 or unsubmitted records from previous years to gerry.thomas7@btinternet.com. Ian and Caroline will help with any id's until I'm up to speed with some of the more unusual cryptic species especially, and as usual, photos would be great.

I'm very happy to receive records at any time of year, ideally listed in the usual spreadsheet format if common, but individually in emails for the more unusual species or species for which you would like id confirmation. Please make every effort to send your 2017 records by 31st December, ideally earlier and more frequently than once a year if convenient.

When all this year's records are in, I will send out a summary list of the records and tetrads by species. In the meantime, Ian has given me a few pointers for species which are potentially under-recorded. Two of these are heathland specialists. We have a total of 9 records for Heather Ladybird, Chilocorus bipustulatus, which can be found in leaf litter and gorse in winter. Slightly better recorded, the Hieroglyphic Ladybird, Coccinella hieroglyphica, hunkers down under heather in colder weather, but we should be able to improve on the 13 records so far. Of the British fauna, yet to be recorded in Shropshire, Bryony Ladybird, Henosepilachna argus is spreading northwards slowly and is worth looking out for in future years.

I know many of you but hope to meet those of you I haven't yet met at future SIG field meetings or county Entomology days. Please feel free to call or email if you have any unusual records or questions.

Kind Regards

Gerry Thomas

Micro-moths in 2017

Mike Shurmer

I took on the role of County Micro-moth Recorder from Godfrey Blunt in June 2017, securing the help of Graham Wenman as my 'assistant' (though Graham is in fact a source of sound advice, second opinions and expertise in larval stages). This is a review of the records so far received in 2017. It is not definitive, as many recorders have not submitted their final records as yet.

My personal highlight of 2017 was a male *Pammene obscurana* (Stephens, 1834), at All Stretton 24 May. This *Betula* feeding species is poorly recorded and little known across the UK, with this becoming the first for Shropshire (gen. det. MPS, conf. P.J.Hall). Our other new species resulted from a long-standing complaint of clothes moth damage in the Jones household. The offending specimen were passed on to Tony Simpson, who confirmed *Tineola bisselliella* (Hummel, 1823), surprisingly the first confirmed record for Shropshire.

Ocnerostoma friesei (Svensson, 1966) was at in Church Stretton on 6 April (G.J.Wenman, genitalia det. MPS), the first Shropshire record away from the Wyre Forest.

Nemapogon ruricolella (Stainton, 1849) was recorded near Atcham in June (T. Hayek, gen. det. A.N.B.Simpson). This would have been the first county record, but for two previous records from the Wyre Forest coming to light this year. Another of the Tineidae, *Nemaxera betulinella* (Paykull, 1785) was recorded at Church Stretton by Graham Wenman (3rd record).

Pammene obscurana - male gen. prep. (Peter Hall - mothdissection.co.uk) -

Gelechiidae records included another species recorded away from the Wyre Forest for the first time, *Syncopacma larseniella* (Gozmány, 1957). This was subject to a remarkable sequence of records from Brown Moss on 16 June (A.T.Jacques), Church Stretton on 20 June (G.J.Wenman) and Kenley Common on 23 June (K.C.Fowler) – (all male, gen. det. MPS). There was also a remarkable run of *Acompsia cinerella* (Clerck, 1759). This species had only been recorded twice before in Shropshire, but in August several individuals were recorded at locations around the Long Mynd by Graham Wenman and myself. Additionally, I recorded a male *Chionodes fumatella* (Douglas, 1850) on the Long Mynd in August (gen. det.). This species was only known from coastal areas until the 1980's and has only been found at Prees Heath before.

Pete Boardman sent me a photo of *Mompha locupletella* ([Denis & Schiffermüller], 1775) from Abdon on 30 May. This was a bit like groundhog day, as Pete had found the first of the previous three county records of this species.

In the Tortricidae, a female *Cnephasia longana* (Haworth, 1811) was at Eardington (E. Griffiths, conf. D.A. Grundy) on 8 August (4th record). Other significant records included *Eana incanana* (Stephens, 1852) at Apley (K.C.Fowler, gen. det. MPS) and All Stretton (gen. det, MPS), the third *Neosphaleroptera nubilana* (Hübner, [1799]) near Atcham (T.Hayek, gen. det. MPS) and a female *Pammene albuginana* (Gueneé, 1845) at Church

Large tabby *Aglossa pinguinali.* (Photo: Jim Shaw)

Crambus uliginosellus. (Photo: Tom Hayek)

Stretton on 1 July (G.J.Wenman, gen. det. MPS), the first away from the Wyre Forest.

There were several good records of Pyralids. A public moth trapping event at Rectory Field, Church Stretton produced a Lesser Wax Moth *Achroia grisella* (Fabricius, 1794). This was the third time that Graham Wenman has recorded this species, the only other record is from 1930. There are only four previous records of Wax moth *Galleria mellonella* (Linnaeus, 1758) from two sites, but this year another two sites recorded this species. Emily Griffiths found it twice at her home near Eardington in July and October, whilst Jim and Ann Shaw recorded this species at Edgmond. The third county record of *Ephestia elutella* (Hübner, 1796), and the first since 1972, was at All Stretton on 17 May (gen. det. MPS). The 8th record of Large Tabby *Aglossa pinguinalis* (Linnaeus, 1758), but only the second since 1984, was recorded in Edgmond (J.&A.Shaw). It appears that this moth may have come in with some bedding material for the family tortoises!

One of the most impressive records of the year was a male *Crambus uliginosellus* (Zeller, 1850) near Atcham (T.Hayek, gen. det. MPS). This wetland species is only known from the northern mosses and has not been seen since 1963.

Much of the recording effort in the autumn has was focused on leaf mines. Interesting records have included *Ectoedemia angulifasciella (*Stainton, 1849) at Catherton Common and All Stretton, away from the usual areas. *Stigmella alnetella* (Stainton, 1856), one of the troublesome species pair feeding on Alder, was found at Catherton Common and Caer Caradoc, confirming this species as occurring in Shropshire. *Stigmella incognitella* (Herrich-Schäffer, 1855) was at Lyth Hill (7th record). The 5th record of *Caloptilia* cuculipennella (Hübner, 1796) was at Llanymynech Rocks (J.Shaw, conf. D.A.Grundy). Finally, *Phyllonorycter viminiella* (Sircom, 1848) was confirmed from Catherton Common (6th record). Leaf mining species are generally poorly recorded, and future records are welcomed.

I want to end this update by recognising the huge contribution that Godfrey has made to micro-moth recording in the county. His own efforts have vastly improved our knowledge, culminating in the 'The Smaller Moths of Shropshire', the closest we have to a micro-moth 'bible' for the county. He has also encouraged and developed a committed group of recorders, myself included. I wish Godfrey all the best with his future endeavours.

Psocoptera report - 2016

Keith Fowler

The number of records on the county list has increased from 236 to 459, not quite double, but not far off. This is still a disappointing number in view of the abundance of these insects. The number of records was given a boost by specimens collected by Natural England from the Wyre Forest in 2015 (determined in 2016) when they fogged a few ancient oaks with insecticide in an attempt to baseline the range of invertebrates inhabiting the oaks.

The Wyre Forest fogging specimens from oaks in Longdon Wood included several species that had not been previously recorded. These were:

- *Amphigerontia bifasciata* (Latreille, 1799) (Psocoptera: Psocidae) on 24 June 2015 at grid reference SO7514177757;
- *Elipsocus pumilis* (Hagen, 1861) (Psocoptera: Elipsocidae) on 24 June 2015 also at grid reference SO7514177757; a second record was submitted to iRecord by Pete Boardman on 28 December 2015 at Abdon (SO576867) – this is one of 29 psocoptera records awaiting verification – an issue that needs to be addressed; further records were made in 2016 from Aston Locks Nature Reserve on the Montgomery Canal near Queen's Head (SJ336264) and from Cold Hatton (SJ618213);
- *Lachesilla pedicularia* (Linnaeus, 1758) (Psocoptera: Lachesillidae) on 3 July 2017 at grid reference SO7536877228;
- *Loensia pearmani* Kimmins, 1941 (Psocoptera: Psocidae) on 3 July 2017 also at grid reference SO7536877228.

Seven other species were recorded for the first time:

- *Bertkauia lucifuga* (Rambur, 1842) (Psocoptera: Epipsocidae) - found by Pete Boardman in Abdon (SO576867) on 24 August 2015 – this is also a record on iRecord awaiting verification; another was found on 21 August 2016 by David Williams in Clive churchyard (SJ514240) on the underside of fallen yew bark beneath the parent tree;
- *Epicaecilius pilipennis* (Lienhard, 1996) (Psocoptera: Caeciliusidae) – discovered on 20 October 2016 in my garden (SJ653122) when I noticed it moving on a tree whilst clearing a flower bed;

Bertkauia lucifuga. (Photo: David Williams)

- *Peripsocus alboguttatus* (Dalman, 1823) (Psocoptera: Peripsocidae) - beaten from heather in the heathland on Stony Hill, Telford (SJ668062) on 24 August 2016;
- *Peripsocus didymus* Roesler, 1939 (Psocoptera: Peripsocidae) - found on 24 April 2016 at Shawbury Heath (SJ5419) from the vegetation on a ride through the conifer plantation;
- *Peripsocus parvulus* Kolbe, 1880 (Psocoptera: Peripsocidae) - beaten from larch in Abdon churchyard (SO575866) on 16 August 2016;
- *Pteroxanium kelloggi* (Ribaga, 1905) (Psocoptera: Lepidopsocidae) - found by Pete Boardman in Abdon (SO576867) on 29 August 2015 – this is another record on iRecord awaiting verification;
- *Valenzuela piceus* (Kolbe, 1882) (Psocoptera: Caeciliusidae) – a number were swept from heather and beaten from broom at Stony Hill (SJ668062) on 24 August 2016. A couple more were found in gorse at Catherton Common (SO636786) on 7 September 2016.

An atlas of the psocoptera records has now been included on Tomorrow's Biodiversity's website (http://www.tombio.uk/). It can be viewed by selecting the "Visualise" menu, then "Online maps and atlases", and finally "Shropshire psocoptera".

New aculeates for Shropshire

Nigel Jones and Ian Cheeseborough

Since the publication of A *Provisional Atlas of Bees Wasps and Ants of Shropshire* in 2014 (Jones & Cheeseborough, 2014), the list of new aculeates for the county has been added to at a much slower rate than in the years of rather frantic field work leading up to publication. 2017 however has seen a relative

1. *Anteon flavicorne* female

surge in additions to the list, with a magnificent five new species having been discovered. We can also report a sixth new species, added in 2016 – the spider wasp *Evagetes dubius* (Vander Linden,1827), which Ian Cheeseborough collected from Gonsal Quarry near Condover 5 August 2016. This was a much unexpected find, as *E. dubius* has previously been recorded only from southern counties of

2. Sickle shaped modified front tarsus of *Anteon flavicorne* female

England and the East Anglian Brecks, but with a recent record from Worcestershire.

During 2017, by targeting very small wasps in the sweep net, Nigel Jones managed to collect two diminutive wasps in the family Dryinidae. On 7 July a female *Anteon ephippiger* (Dalman,1818) was collected from an old limestone quarry near Blakeway Hollow, Much Wenlock. Two days later, at Priorslee, Telford a female *Anteon flavicorne* was swept from tree foliage. Female *Anteon* are remarkable for their modified front tarsi which have long claspers, used to hold leafhopper, whilst they introduce an egg to the unfortunate host. On 6 July 2016, at Underton Quarry, near Bridgnorth, Ian Cheeseborough picked up another of the tiny wasps belonging to the group of aculeates fondly known as "DEBs" (Bethylids, Embolids and Dryinids), which was determined as the Bethylid *Bethylus cephalotes* (Förster,1860).

Ian Cheeseborough discovered the small black wasp *Crossocerus styrius* (Kohl,1892) in the churchyard at Ratlinghope on 17 June 2017. Finally, a splendid day at the National Trust's Dudmaston Estate was rounded off by the capture, identification and release of the Chrysidid wasp *Elampus panzeri* (Fabricius, 1804), and the shield bug parasite *Astata boops* (Schrank,1781). Both these species had been

3. *Elampus panzeri* from Dudmaston, showing the sharply pointed process on the scutellum.

flagged up in the Atlas as likely to be found in Shropshire, so it was most gratifying to discover them. *E. panzeri* is distinctive amongst the usually cryptic Chrysidid wasps, sporting a long process on the posterior of its scutellum (see photo).

The number of species recorded in Shropshire

now stands at 327, so ten species have been added since publication of the Atlas. A further change in the list relates to the Chrysidid wasp, *Chrysis ignita* (Linnaeus, 1758), all Shropshire specimens of which appear to be *C. terminata* Dahlbohm, 1854, and it is likely that the true *C. ignita* has never been recorded from Shropshire.

Reference

Jones, N. and Cheeseborought, I., 2014. *A Provisional Atlas of the Bees, Wasps and Ants of Shropshire*. Field Studies Council, Telford.

Photos:

Diptera Report 2017 - Part 1

Nigel Jones

It has been a bumper year for finding new species to Shropshire. At the time of writing around 50 new species have been either found and determined during the last year, or determined from specimens collected in previous years. Yet more potentially new species await confirmation. Below summarises 44 of the new finds. I will detail the rest in the next "SEN".

Amongst the dance flies Empididae the genus *Hilara* Meigen, 1822 did the county proud, providing seven new species. These were the Nationally Scarce *H. brevivittata* Macquart, 1827 from the Preston Montford Field Studies Council grounds (9 April 2017); from the Hollies Woodland at Haughmond Hill *H. nigrohirta* Collin, 1927 and *H. pilosa* Zetterstedt, 1842 (5 and 25 May 2017 respectively); from Pentre Wood on 25 June 2017 *H. beckeri* Strobl, 1892 and the Nationally Scarce *H. media* Collin, 1927; and from unimproved meadows at Minton on 26 June 2017 *H. clavipes* (Harris, 1780) and *H. nigrina* (Fallén, 1816). *Hilara* is a genus of homogeneous species, mainly small, blackish and very similarly shaped, often the males have expanded front metatarsi that contain silk. To be certain of identification it is usually necessary to dissect the terminalia, but *H. clavipes* is certainly one of the more distinctive species with large silk pouches and strikingly long bristles on its front legs (see Fig. 1). A second record for this lovely fly was made from near Gatten Plantation on the side of the Stiperstones on 2 July. Another new Empididae was *Empis planetica* Collin, 1927 from Nant Mawr on 14 May 2017.

Fig. 1 *Hilara clavipes* (Photo: Nigel Jones)

The diminutive Hybotid fly *Crossopalpus minimus* Meigen, 1828 was swept from trees at Priorslee, Telford on 12 August 2017 (Fig. 2). At the same site, on 20 June, the scarce Dolichopodid fly *Thrypticus pollinosus* Verrall, 1912 was swept from shallow seasonal wetland.

Fig. 2 *Crossopalpus minimus (*Photo: Nigel Jones)

For the last few years I have put in a serious effort to identify the rather challenging Pipunculidae (big-headed flies), and during 2017 I have managed to record five new members of this family of Homoptera parasitoids, bringing the total of species recorded in Shropshire to 42, around 44% of the British Pipunculid fauna. The five newcomers are *Jassidophaga villosa* (von Roser, 1840), from Wollerton Wetland on 27 June 2016; two from the Hollies woodland at Haughmond Hill - *Cephalosphaera furcata* Enderlein, 1936 on 5 May 2017 and *Cephalops obtusinervis* (Zetterstedt, 1844) on 20 May 2017; and two more from my ever dependable Shrewsbury garden ash tree - *Chalarus juliae* Jervis, 1992 on 1 July 2017 and *C. longicaudis* Jervis, 1992 on 25 June 2017.

The flat-footed flies Platypezidae are a small family of mainly autumnal species that spend their larval stages in fungi. Alone amongst the British species, *Agathomyia wankowiczi* (Schnabl, 1884) induces conspicuous galls in its host fungi *Ganoderma applantum*, making it easy to record. It was first discovered in Britain in 1991 and on 9 July 2017 Roger Littleover found the first Shropshire galled *Ganoderma* at Comer Wood, Dudmaston, and mycologist Sue Leather also reported it there on 14 April (Fig. 3).

The Phoridae infamously known as the "horrid Phorids" on account of the perceived difficulty of

Fig. 3 *Agathomyia wankowiczi* galls on *Ganoderma applantum*. (Photo: Sue Leather)

tackling this mega-diverse family (it's probably by far the largest family of flies on the planet) are a family that I have almost totally avoided. On 3 August 2016, at Wollerton Wetland, I retained an unusually large specimen which keyed quite easily to *Borophaga incrassata* Meigen, 1830. It is a minor pest of honey bee hives, but as far as I know is unrecorded from the county.

One of my favourite fly families is the Lance-flies Lonchaeidae. These smart, little shiny flies mainly inhabit woodlands, where they are strongly associated with dead wood. During 2017 I collected two new county species: *Lonchaea obscuritarsis* Collin, 1953, from Priorslee, Telford, 7 May 2017 and *L. subneotosa* Kovalev, 1974, from Gonsal Quarry near Condover, 10 May 2017.

Fig. 4 *Leoimyza dudai* (Photo: Nigel Jones)

Silver flies Chamaemyiidae are small, generally silvery-grey dusted flies, inhabiting grasslands, where they hunt down and eat aphids, scale insects and related insects. Two new county species are *Chamaemyia sylvatica* Collin, 1966 from Earl's Hill, 3 June 2016 and *C. nigripalpis* Collin, 1966 from Haughmond Hill, 3 July 2016.

Pam's Pools at Underton and the nearby conservation area in the disused part of Underton Quarry have previously yielded several county firsts and scarce species. Now there are two more. *Leiomyza dudai* Sabrosky, 1956 (family: Asteiidae) was taken by myself on 19 June 2016 (Fig. 4). It's getting increasingly difficult to find new hoverfly (Syrphidae) species in the county, as they have been more thoroughly recorded, for nearly thirty years, than any other family, so Mike Shurmer's discovery of *Neoascia interrupta* on 23 April 2017 is a noteworthy find.

I have long regarded the lesser-dung flies flies Sphaeroceridae as small, hard to determine flies, so I have tended to avoid them, but recently I have started to give them a go and have found that some are not too difficult after all to identify. Three new species are *Crumomyia pedestris* Meigen, 1830, Wollerton Wetland, 27 June 2016; *Ischiolepta pusilla* (Fallén, 1820) Bagbatch, Long Mynd, 23 July 2017 and *Pullimosina heteroneura* (Haliday, 1836) Pentre Wood, 18 October 2017.

A couple of new Drosophilidae were welcome additions to the county fauna. Two *Amiota alboguttata* were recovered from a vane trap set high up in a tree at Attingham Park, during July 2017, by Emma Bonham of the Forestry Commission. This is a Nationally Scarce fly associated with old woodlands and parkland. Numerous male and female *Hirtodrosophila trivittata* were found on their host fungi oyster mushroom *Pleurotus ostreatus* at Haughmond Hill on 25 July 2017 (Fig. 5). *H. trivittata* was new to Britain in 2008, since when it has been expanding its range across the country.

Fig. 5 *Hirtodrosophila trivittata* on oyster mushroom (Photo: Nigel Jones)

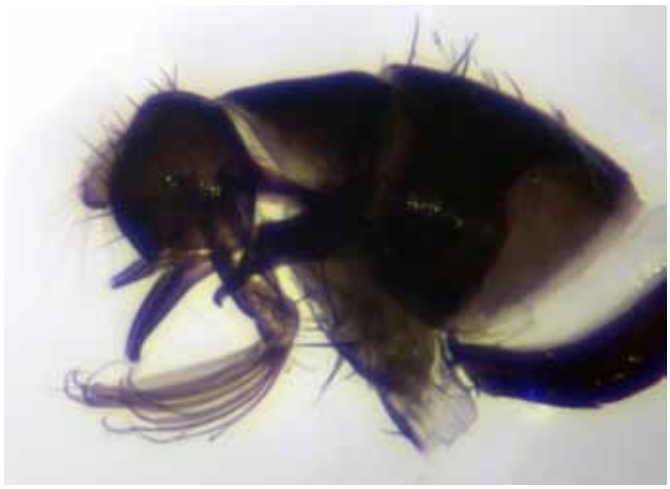


Fig. 6 *Meoneura neottiophila* terminalia showing brush like appendage (Photo: Nigel Jones)

Six more Acalyperate flies previously unrecorded in Shropshire are *Poecilolycia vittata* (Walker, 1849) [family: Lauxaniidae], Minton, 26 June 2017; *Meoneura neottiophila* Collin, 1930 [family: Carnidae] Haughmond Hill, 25 July 2017 - numbers walking over *Polyporus* fungi. Fig. 6 shows the very distinctive brush of hairs in the terminalia of this tiny fly; the seldom recorded *Pseudopomyza atrimana* (Meigen, 1830) [family: Pseudopomyzidae], was found at The Hollies, Haughmond Hill 27 May 2016; the Tephritid fly *Chetostoma curvinerve* Rondani, 1856 is a

Fig. 7 Face of female *Chetostoma curvinerve (*Photo: Nigel Jones)

previously rare UK species that has become more frequent in recent years. I swept a single female from the ash tree in my Shrewsbury garden on 25 July 2017. The male, and to a lesser extent the female have long bristles ascending their faces (Fig. 7). A trip to Earl's Hill on 3 June 2016 generated two new species: *Amauromyza morionella* Zetterstedt, 1848) [family: Agromyzidae] and *Limnellia fallax* (Czerny, 1903) [family: Ephydridae].

A couple of new Muscidae are: *Limnophora tigrina* (Am Stein, 1860) from Underton, 5 July 2016 and *Helina maculipennis* (Zetterstedt, 1845) from Huglith Wood, Westcott, 14 August 2016. Another new find at Huglith Wood was the Opomyzid fly *Geomyza majuscula* (Loew, 1864).

Closely related to the Muscidae are the Anthomyiidae. For Dipterists this has been a much ignored family, because until quite recently no keys have been available. Now, courtesy of Michael Ackland, we have keys and accurate genitalia illustrations for every species, enabling confident identification of most Anthomyids. This is quite a large family, so unsurprisingly we are finding previously unrecorded county species: very early in the season *Egle* Robineau-Desvoidy, 1830 are to be found about willow trees, where the larvae mine the seeds. Two new county species are *Egle minuta* (Meigen, 1836) from Shrewsbury, 8 March 2017 and *Egle lyneborgi* Ackland & Griffiths, 2003 from Venus Bank, Cound on 21 March 2017. Other new Anthomyiids are *Lasiomma strigilatum* (Zetterstedt, 1838), from Preston Montford, 8 April 2017 and *Leucophora grisella* Hennig, 1967, from Dudmaston. This last species is a cleptoparasite of mining bees. Other members of the genus have been found locally only in April and early May.

Two Tachinid flies new to the county are *Medina separata* (Meigen, 1824) Gonsal Quarry, 6 June 2016 and the Nationally Scarce *Actia infantula* (Zetterstedt, 1844) Stapeley Hill, 18 July 2017.

Finally, on 9 October, as the 2017 season drew to a close, I swept my garden ash and took a single specimen of the distinctively marked fungus gnat Mycetophilidae *Greenomyia mongolica* Laštovka & Matile, 1974 (Fig. 8). This fungus gnat has broad dark marks across its wing tips. Somehow it remained undescribed until 1974 and was first discovered in Britain in 2008, since when it has been expanding its range across the country.

Fig. 8 *Greenomyia mongolica (*Photo: Nigel Jones)

Fig. 9 *Thecophora fulvipes (*Photo: Nigel Jones)

Apart from the plethora of county firsts, a noteworthy record is the Conopid fly *Thecophora fulvipes* (Robineau-Desvoidy, 1830), only previously recorded in Shropshire by David Denman way back in August 1986 at Craig Sychtyn Nature Reserve. I collected a single specimen from Bagbatch, Long Mynd, 23 July 2017 (Fig. 9); the highlight of an excellent day with the Joy of Wildlife group.

Hemiptera report 2016

Keith Fowler

Psyllids

This remains an under recorded group. I generally receive very few records other than from Dan Knight. However the records did benefit from large scale surveys carried out by Natural England in the Wyre Forest and Emma Bonham at Attingham Park. Altogether 144 records were added to the county list.

Three species were added this year:

- *Craspedolepta nervosa* (Förster, 1848) (Hemiptera: Psyllidae) – found by Dan Knight in Oswestry (SJ296288) on 27 Jun 2016;
- *Psylla betulae* (Linnaeus, 1758) (Hemiptera: Psyllidae) – was beaten from a birch in grassland on the foothills of Brown Clee (SO607871) on 16 August 2016;
- *Trioza centranthi* (Vallot, 1829) (Hemiptera: Triozidae) – caught in an aerial trap in Attingham Park (SJ5486709917) on 17 August 2016 by Emma Bonham.

Auchenorrhyncha

Twenty-seven recorders, a very encouraging number, contributed records this year, although the vast majority of the records additional to my own were submitted by Dan Knight and Jim Cresswell. The aerial traps employed by Emma Bonham in Attingham Park collected a good range of species. The fogging exercise carried out by Natural England in the Wyre forest found a more restricted range but many of the species in abundance. In all 822 records were added to the county list.

Six new species added this year:

- *Arthaldeus striifrons* (Kirschbaum, 1868) (Hemiptera: Cicadellidae) – was swept from grassland in the ash disposal site at Devil's Dingle, Buildwas (SJ640054) on 8 June 2016;
- *Edwardsiana bergmani* (Tullgren, 1916) (Hemiptera: Cicadellidae) - was beaten from a birch in grassland on the foothills of Brown Clee (SO607871) on 16 August 2016 (if I remember correctly from the same tree as *Psylla betulae* – see above);
- *Hauptidia maroccana* (Melichar, 1907) (Hemiptera: Cicadellidae) – was beaten from foxgloves growing under the trees at the summit of Bromlow Callow (SJ324011) on 6 June 2016;
- *Mocydiopsis parvicauda* Ribaut, 1939 (Hemiptera: Cicadellidae) – was found using a vacuum sampler at the Veolia site at Coalmoor (SJ663061) on 17 April 2017. A further record was made at Catherton Common (SO640788) on 7 September 2016;
- *Populicerus albicans* (Kirschbaum, 1868) (Hemiptera: Cicadellidae) – found by Dan Knight at Oswestry (SJ301288) on 27 August 2017;
- *Ribautiana debilis* (Douglas, 1876) (Hemiptera: Cicadellidae) – found by Jim Cresswell in a mixed clump of bramble and bracken in Prees Heath (SJ562382) on 2 November 2016.

Shieldbugs and allies

The number of records for this group continues to ebb away following the publication of the atlas in 2014 despite the continued high number of recorders (36) who have submitted at least one record. As I found this group to be easier to find than in the atlas years the lack of urgency of a target rather than abundance could be the reason for the decline. 413 records were added to county list of which about 5% were submitted via iRecord.

No new species were recorded in 2016.

Other Terrestrial Heteroptera

This was a bumper year in terms of the number of records, number of new species and number of recorders, but, as with the other groups, the vast majority of the records were submitted by a few individuals with most of the other recorders submitting fewer than five records. However it is encouraging that so many will look at this group of insects when out and about. 1,342 records were added to the county list.

The fogging exercise mentioned before illustrated how abundant some species are when looking at the whole of a tree rather than just the branches within reach of a net. One species recorded for the first time by this method was *Psallus mollis* and there were 68 males caught. (The females were not counted as they cannot be identified to species.)

Thirteen species were recorded for the first time:

- *Acompus rufipes* (Wolff, 1804) (Hemiptera:

Lygaeidae) – found on 24 June 2016 at Dothill Local Nature Reserve (SJ639130) by sweeping rough grassland;

- *Berytinus signoreti* (Fieber, 1859) (Hemiptera: Berytidae) – was clinging to my fleece as I was packing the car after a day at Severn Valley Country Park (SO754836) on 31 August 2016;
- *Buchananiella continua* (White, 1880) (Hemiptera: Anthocoridae) – beaten from ivy on a tree at the edge of Tee Lake in Dothill Local Nature Reserve (SJ642130) on 8 April 2016;
- *Eremocoris podagricus* (Fabricius, 1775) (Hemiptera: Lygaeidae) – was collected by vacuum sampling the marginal vegetation at the side of a pool in Severn Valley Country Park (SO754839) on 11 May 2016;
- *Globiceps flavomaculatus* (Fabricius, 1794) (Hemiptera: Miridae) – found by Dan Knight in Dyffryd (SJ297202) on 30 July 2015;
- *Lasiosomus enervis* (Herrich-Schäffer, 1841) (Hemiptera: Lygaeidae) – found by Dan Knight at Morda (SJ284281) on 30 March 2016; a second was swept from willowherb in the marginal vegetation of a ride at Radnor Wood (SO321814) on 21 June 2016;
- *Orius laevigatus* (Fieber, 1860) (Hemiptera: Anthocoridae) – found by Nigel Jones at Eardington Quarry (SO724900) on 14 August 2006 - this was amongst a number of specimens donated to the Preston Montford collection by Nigel;
- *Orthotylus concolor* (Kirschbaum, 1856) (Hemiptera: Miridae) – found by Nigel Jones at Prees Heath (SJ5536) on 6 September 2007 – this was also in the specimens donated by Nigel; more recently a second record was made at Grinshill (SJ516240) on 21 August 2016 when the insect was beaten from gorse and a third from Catherton Common (SO637787) on 7 September 2016;
- *Psallus mollis* (Mulsant & Rey, 1852) (Hemiptera: Miridae) – found on oak by Natural England in Wyre Forest at grid reference SO7536877228 on 3 July 2015 in the fogging exercise (see above); further records were made at Hilton Sand Pit (SO777948) on 6 July 2016 when one was beaten from oak and from Attinhgam Park at grid reference SJ5582109712 between 20 July 2016 and 2 August 2016 in an aerial trap set by Emma Bonham;
- *Scolopostethus puberulus* Horváth, 1887 (Hemiptera: Lygaeidae) – was collected by vacuum sampling the heathland in Dale Coppice, Coalbrookdale (SJ672048) on 26 October 2016;
- *Sthenarus rotermundi* (Scholtz, 1847) (Hemiptera: Miridae) – found on 20 August 2016 at Ifton Meadows (SJ319375) by Dan Knight; a second record was made by Dan at West Felton (SJ343254) eight days later;
- *Xylocoridea brevipennis* Reuter, 1876 (Hemiptera: Anthocoridae) – found on oak by Natural England in Wyre Forest at grid reference SO7536877228 on 3 July 2015 in the fogging exercise;
- *Xylocoris galactinus* (Fieber, 1836) (Hemiptera: Anthocoridae) – found by Bryan Formstone in cut sedge litter at Sweeney Fen (SJ274250) on 18 September 2016.

Xylocoris galactinus. Photo by Bryan Formstone

Online atlases

Atlases that include all the records received for these four groups of hemiptera are available on Tomorrow's Biodiversity's website (http://www.tombio.uk/).

They can be viewed by selecting the "Visualise" menu, then "Online maps and atlases", and finally the atlas of interest:

- Shropshire shieldbugs
- Shropshire psyllids
- Shropshire terrestrial hemiptera
- Shropshire auchenorrhyncha

The County Recorder Network

This information is accurate at the time of publication. All these people carry out their roles as volunteers and we are indebted to their hard work.

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Odonata (damselflies and dragonflies)

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Hemiptera (true bugs)

Terrestrial Bugs (now including shieldbugs), the Auchenorrhyncha and Psylloidea (Hemiptera) – Keith Fowler –
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Coleoptera (beetles)

Beetles (all families except Ladybirds and water beetles) – Caroline Uff
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Diptera (true flies)

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Leaf-mining flies (Agromyzidae) – Godfrey Blunt
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Hymenoptera (bees, wasps, ants etc)

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Caddisflies (Trichocera) and **Stoneflies** (Plecoptera) – Frances Riding
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Hexapods

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Others

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